MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2017/2018

DCS5078 – DATABASE SYSTEMS

(For Diploma students only)

16 MARCH 2018
9:00 a.m. – 11:00 a.m.
(2 Hours)

INSTRUCTIONS TO STUDENT:

1. This question paper consists of 11 pages with 2 sections.
2. **SECTION A**: Answer **ALL** Multiple Choice Questions on the OMR sheet given.
3. **SECTION B**: Answer **ALL** Structured Questions in the Answer Booklet provided.

Section A: 40 Multiple Choice Questions (40 Marks)
*Instruction: Shade your answers on the **OMR sheet** provided.*

1. Which of the following is **TRUE** about information?
   I. Not yet been processed to reveal the meaning.
   II. Produced by processing data.
   III. Reveals the meaning of data.
   IV. Enables knowledge creation.

   A. I, II and III
   B. I, II and IV
   C. II, III and IV
   D. All of the above.

2. _____ is the process of promoting accuracy, validity, and timeliness of data.
   A. Data security
   B. Data sharing
   C. Data access
   D. Data quality

3. _____ is a database that is designed to support a company's day-to-day operations.
   A. Desktop database
   B. Operational database
   C. Analytical database
   D. Distributed database

4. Data storage characteristic that is changed without affecting the program's ability to access the data is called _____.
   A. data independence
   B. data dependence
   C. data redundancy
   D. data anomaly

5. A _____ develops when not all of the required changes in the redundant data are made successfully.
   A. structure dependence
   B. structure independence
   C. data redundancy
   D. data anomaly

6. _____ is translated into entities when translating business rules into data model components.
   A. Verbs
   B. Nouns
   C. Relationship
   D. Relationship type

Continued...

7. Which of the following statements is the advantage of Object-Oriented Model?
   A. Complex navigational system.
   B. Learning curve is steep.
   C. High system overhead slows transactions.
   D. Visual representation includes semantic content.

8. All of the following describes functional dependency **EXCEPT** _____.
   A. value of one or more attributes determines the value of one or more other attributes
   B. determinant is an attribute whose value determines another
   C. entire collection of attributes in the determinant is necessary for the relationship
   D. dependent is an attribute whose value is determined by the other attribute

9. Entity integrity states that _____.
   A. all of the values in the primary key must be unique
   B. attribute that is a part of a key
   C. key that is composed of more than one attribute
   D. an inapplicable condition

10. Relational set operator that uses one 2-column table as the dividend and one single-column table as the divisor is known as _____.
    A. outer join
    B. inner join
    C. equijoin
    D. divide

11. Domain can be assigned to the following attributes **EXCEPT** _____.
    A. gender
    B. CGPA
    C. name
    D. married status

12. What does the following Chen notation diagram state?

    A. One patient can meet one doctor; one doctor can be met by one patient.
    B. One patient can meet many doctors; many patients can be meet by many doctors.
    C. A patient can meet many doctors; each doctor can be met by many doctors.
    D. Many patients can meet one doctor; one doctor can be met by one patient.

13. Which of the terms best describes the statement given below?

"An attribute that can be subdivided to yield additional attributes."

    A. Composite identifier
    B. Simple attribute
    C. Composite attribute
    D. Multivalued attributes

Continued...

14.

- *Entity exists apart from all of its related entities.*
- *Referred to as a strong entity or regular entity.*

The statements above referred to _____.

A. Existence independence
B. Entity dependence
C. Existence dependence
D. Relational independence

15. Under what condition an entity is determined as a weak entity?
A. Entity exists in the database when it is not associated with other entities.
B. Has a primary key that is partially or totally derived from parent entity in the relationship.
C. Does not contain foreign key.
D. All of the above.

16. The SQL constraints _____ is used to assign value automatically to an attribute when a new row is added to table.
A. DEFAULT
B. CHECK
C. UNIQUE
D. NOT NULL

17. SQL requires the use of the _____ command to remove a column from a table.
A. MODIFY TABLE
B. INSERT TABLE
C. DELETE TABLE
D. ALTER TABLE

18. Which SQL command is used for listing order according to specific column or row in the table?
A. DROP
B. ORDER BY
C. LIST BY
D. DISTINCT

19. _____ clause restricts the output of GROUP BY query by applying conditional criteria to the grouped rows.
A. HAVING
B. IN
C. WHERE
D. BETWEEN

20. To combine rows from two queries and returning only the rows that appear in both sets is referring to the used of _____ query.
A. UNION ALL
B. INTERSECT
C. INNER JOIN
D. OUTER JOIN

Continued...

21. The attribute B is fully functionally dependent on the attribute A if each value of A determines one and only one value of B. This concept is known as _____.
    A. functional dependence
    B. functional independence
    C. fully functional dependence
    D. fully functional independence

22. _____ is a condition in which an attribute is dependent on another attribute that is not part of the primary key.
    A. Partial dependency
    B. Functional dependency
    C. Transitive dependency
    D. Active dependency

23. Which of the following is **TRUE** about conversion to 3rd Normal Form?
    A. The table must be in 1st Normal Form.
    B. Make new tables to eliminate transitive dependencies.
    C. The table contains partial dependency before conversion.
    D. The table has repeating groups.

24. *"All attributes must be dependent on the primary key, but they must be independent of each other"*

    The above statement is referring to the rule that is applied in _____.
    A. 1st Normal Form (1NF)
    B. 2nd Normal Form (2NF)
    C. 3rd Normal Form (3NF)
    D. 4th Normal Form (4NF)

25. What kind of defect do unnormalized tables suffer?
    A. Indexing is more cumbersome.
    B. No simple strategies for creating virtual tables known as views.
    C. Data updates are less efficient because tables are larger.
    D. All of the above.

26. The phases involved in Systems Development Life Cycle (SDLC) are _____.
    A. Planning → Analysis → Implementation → Systems Design → Maintenance
    B. Analysis → Planning → Implementation → Systems Design → Maintenance
    C. Systems Design → Analysis → Planning → Implementation → Maintenance
    D. Planning → Analysis → Systems Design → Maintenance → Implementation

27. Installation of DBMS, creation of the database and loading or conversion of the data are the actions done in _____ DBLC phase.
    A. database design
    B. operation
    C. implementation and loading
    D. maintenance and evolution

Continued...

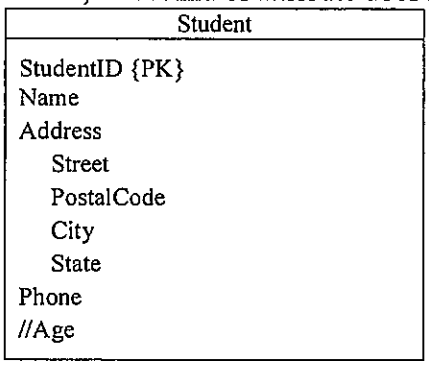
28. Which of the following activities is **NOT** involved in logical design?
    A. Define query execution parameters.
    B. Ensure entity and referential integrity.
    C. Define column constraints.
    D. Normalize set of tables.

29. _____ allows the assignment of access rights to specific authorized users and is usually enforced at login time at operating system level.
    A. Password security
    B. Physical security
    C. Audit trails
    D. Diskless workstation

30. Which of the following activities is involved in periodic maintenance?
    A. Assignment of access permissions and their maintenance for new and old users.
    B. Adaptive maintenance.
    C. Periodic security audits based on the system-generated statistics.
    D. All of the above.

31. In UML, a class is represented by a box that has 3 sections: the top section shows _____, the middle section shows _____ and the last section shows _____.
    A. class name, attributes, operations
    B. attributes, class name, operations
    C. object, attributes, methods
    D. object, class name, methods

32. Based on the diagram below, what kind of attribute does **Age** represent?



    A. Composite attribute
    B. Derived attribute
    C. Standalone attribute
    D. Multi-valued attribute

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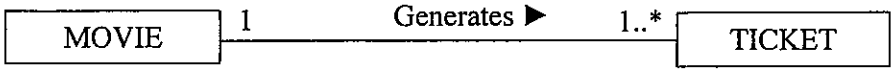
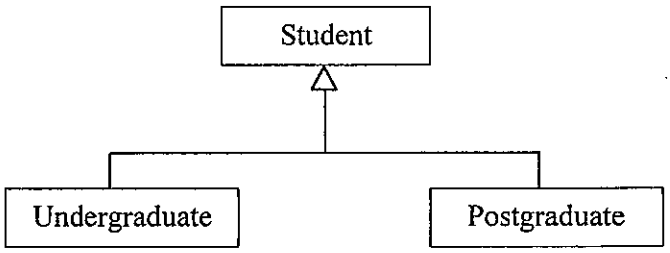
33. Which of the following statements is **NOT** a **TRUE** description about the diagram?



A. The association is many to one from TICKET to MOVIE.
B. One movie can generate one or many tickets.
C. One ticket can be generated by many movies.
D. The minimum multiplicity for MOVIE is 1.

34. The _____ entity contains the common characteristics and the _____ entity contains the unique characteristics of each entity.
A. subtype, strong
B. weak, subtype
C. supertype, subtype
D. subtype, supertype

35. Which of the following is **NOT TRUE** about the diagram below?



A. Undergraduate and Postgraduate inherit attributes from Student.
B. Student is the supertype of Undergraduate and Postgraduate.
C. Undergraduate is the subtype of Postgraduate.
D. Postgraduate has its own unique attributes and characteristics.

36. Which of the following reasons can cause data to suffer from inaccuracies and inconsistencies?
A. Use of synonyms and homonyms across systems.
B. Nonstandard use of abbreviations in character data.
C. Data entry errors and typographical errors.
D. All of the above.

37.
- *Produced query results within specified performance levels.*
- *Enhance the company's short-term operations.*

These above roles of database are implemented at _____ in an organization.
A. top management level
B. middle management level
C. operational management level
D. all of the above

Continued...

38. Which of the following is **NOT TRUE** about security goals in information systems?
    A. Keeping data consistent and free of errors or anomalies.
    B. Accessibility of data whenever required by any user.
    C. Protecting data against unauthorized access.
    D. Activities that meet data privacy and security reporting guidelines.

39. Authorization management defines procedures to protect and guarantee database security and integrity. These procedures include _____.
    I. user access management
    II. DBMS access control
    III. DBMS usage monitoring
    IV. disaster management

    A. I and II
    B. II and III
    C. I, II and III
    D. I, III and IV

40. Which of the following components is **NOT** included in CASE tools?
    A. Graphics
    B. Analysis segment
    C. Screen painters
    D. Excel report generators

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Section B: 4 Structured Questions (60 Marks)

*Instruction: Write your answers in the **Answer Booklet**.*

Question 1 (20 Marks)

Gapurna Sdn. Bhd. is a company specialized in car servicing. Due to the new policy, the company manager has decided to upgrade their car servicing system. The database designer of the company has to design a new database system according to the requirements needed by the manager. Below is the scenario of the company.

Before sending the cars for servicing, customers need to provide their name, phone, email and address as a record. Nowadays, most of the customers have minimum one car and some of them own more than one car. But each car is owned by only one customer. The car details such as serial number, model, colour, and year production will be saved in the system as well. When customers take in one or more cars for repair or service, a service ticket is generated for each car which takes note of the date received date return and comments of the car. A car may have few service tickets if the customers often bring their cars for service.

There will be staffs who handle the service tickets. Each staff can handle many service tickets and each service ticket is handled by only one staff. The staff details are name, phone and email. The service tickets will be passed over to the mechanics to proceed their works. Each service ticket can be worked by more than one mechanic and every mechanic can work on many service tickets. Every services they have done on the car will be recorded.

Some of the car services might require change of spare part, but some may not need any part. Each part can be used in more than one service. The parts details include part name, function and unit price. At the end of the service, the quantity of parts that being used and cost must be saved in the system.

Based on the situation given above, draw a complete Entity Relationship Diagram using the **Crow's Foot** notation which includes:

(i) All entities and attributes
(ii) Relationships
(iii) Connectivity and relationship participation
(iv) Primary and foreign keys

Continued...

Question 2 (20 Marks)

Write the SQL commands based on the tables given below.

FOOD Table

Food_ID	Food_Name	Food_Price	Food_Stock	Food_Rating	F_TypeID
1	Apple Crumb	8.90	20	5	2
2	Hot Chocolate	11.00	10	6	3
3	Moist Cake	10.00	20	6	1
4	Coconut Shake	5.00	10	5	3
5	Milk Tea	7.90	5	4	3
6	Nasi Ayam	6.50	30	5	4
7	Red velvet Cake	10.00	20	6	1
8	Orange Truffle	10.00	10	5	2

TYPE Table

Type_ID	Type_Name
1	Cake
2	Pie
3	Drink
4	Rice

a) Display the food based on the food type "Cake". [3 marks]

Food_ID	Food_Name	F_TypeID
3	Moist Cake	1
7	Red velvet Cake	1

b) Sort the food name in descending order as shown in the table below. [1 marks]

Food_ID	Food_Name	Food_Price
8	Orange Truffle	10.00
7	Red velvet Cake	10.00
6	Nasi Ayam	6.50
5	Milk Tea	7.90
4	Coconut Shake	5.00
3	Moist Cake	10.00
2	Hot Chocolate	11.00
1	Apple Crumb	8.90

c) Calculate the total food rating of all foods. [1 marks]

Total Rating
42

Continued...

d) Add another field in the TYPE table called "TypeDate". This field will store the expired date for food and it cannot be empty. [2 marks]

e) Insert a new record as shown below. [3 marks]

Food_Name	Food_Price	Food_Stock	Food_Rating	F_TypeID
Tiramisu Cake	12.00	10	5	1

f) Display all information about the food that starts with the letter 'O' and the price is more than RM7.00. [2 marks]

Food_ID	Food_Name	Food_Price
8	Orange Truffle	10.00

g) Show the minimum, maximum and average stock of food in this database. [2 marks]

Lowest	Highest	Average
5	30	15.00

h) Display the total of food based on food type as shown below. [4 marks]

Type_Name	Total Cake
Cake	3
Drink	3
Pie	2

i) Show **TWO** ways to remove all the records from FOOD table. [2 marks]

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Question 3 (20 Marks)

The report below shows the result of Diploma students in MMU. Based on the record below:

Student ID	Student Name	Program	Date Registered	Advisor ID	Advisor Name	Office Number	Subject Code	Subject Name	Credit Hour	Passing Grade	Lecturer ID	Lecturer Name	Student Mark
117111	Alex Lim	DIT	1/3/2017	100121	Maria Wong	06-2324555	DCS5078	Database Systems	4	C+	100224	Robert	70
117111	Alex Lim	DIT	1/3/2017	100121	Maria Wong	06-2324555	DCS5088	OOP	4	C	100675	Chan	75
117233	Jennie	DBIS	1/3/2017	100145	Jimmy	06-2324678	DCS5078	Database Systems	4	C+	100224	Robert	80
117365	Kumar	DBIS	4/7/2017	100234	Willy Ng	05-2327878	DBS5028	E-Commerce	3	C	100367	Brian Lo	65
117365	Farah	DBIS	4/7/2017	100145	Jimmy	06-2324678	DBS5028	E-Commerce	3	C	100367	Brian Lo	72

a) Write 1st, 2nd, and 3rd Normal Forms. [14.25 marks]
b) Draw the Dependency Diagram for 2nd Normal Form. [5.75 marks]

End of Page.